PEACE/WILLISTON
FISH & WILDLIFE
COMPENSATION
PROGRAM

BCHydro

BRITISH
COLUMBIA

A Reconnaissance Survey Of Swamp Grass Lake

M. J. Hunter
March 1997

PWFWCP Report No. 168

105-02083/

The Peace/Williston Fish & Wildlife Compensation Program is a cooperative venture of BC Hydro and the provincial fish and wildlife management agencies, supported by funding from BC Hydro. The Program was established to enhance and protect fish and wildlife resources affected by the construction of the W.A.C. Bennett and Peace Canyon dams on the Peace River, and the subsequent creation of the Williston and Dinosaur Reservoirs.

Peace/Williston Fish and Wildlife Compensation Program, 1011 Fourth Ave. 3rd Floor, Prince George B.C. V2L 3H9

Website: *www.bchydro.bc.ca/environment/initiatives/pwcp/*

This report has been approved by the Peace/Williston Fish and Wildlife Compensation Program Fish Technical Committee.

Citation: M. J. Hunter. March 1997. A reconnaissance survey of Swamp Grass Lake. Peace/Williston Fish and Wildlife Compensation Program, Report No. 168. 20pp plus appendices.

Author(s): Mark J. Hunter[1]
Address(es): [1] Peace/Williston Fish and Wildlife Compensation Program, 1011 Fourth Ave., 3rd Floor Prince George, B.C. V2L 3H9

A RECONNAISSANCE SURVEY OF

SWAMP GRASS LAKE

WATERSHED:	**Williston Reservoir (Parsnip Reach)**
DATE OF SURVEY:	**October 9 -10,1996**
FIELD CREW LEADER:	**Mark Hunter**
FIELD ASSISTANT:	**Karin Mathias**
REPORT PREPARED BY:	**Mark Hunter**

BRITISH COLUMBIA CONSERVATION FOUNDATION

PEACE / WILLISTON FISH AND WILDLIFE COMPENSATION PROGRAM

B. C. MINISTRY OF ENVIRONMENT, LANDS AND PARKS

FUNDED BY: FOREST RENEWAL BRITISH COLUMBIA

RELEASED BY: _____

D. J. Cadden, Regional Fisheries Biologist

LAKE: Swamp Grass Lake **SYSTEM NAME:** McLeod River

A.S.A.P. REFERENCE NO.: **WATERSHED CODE: 230-9068-556-176**

DATA ON FILE FOR THIS SURVEY

Location	X	Dissolved 02 / Temp. Profiles	X
Physical Data	X	Winter Dissolved 02 / Temp. Profiles	--
Bench Mark	X	Netting Record	X
Terrain Features	X	Lake Catch Summary	X
Access	X	Individual Fish Data	--
Resorts and Campsites	X	Fish Preserved	--
Other Developments	X	Stomach Analysis	--
Obstructions and Pollutions	X	Scale Reading	--
Special Restrictions	X	Location of Inventory Sites	X
Aquatic Plants	X	Photograph Directory	X
Wildlife Observations	X	Appendices	
Miscellaneous Comments	X	A: Water Chemistry Analysis	X
Lake Drainage	X	B: Tributary Stream Data	--
Fisheries Management Comments	X	C: Fish Scale Analysis	--
History of Previous Surveys	X	Bathymetric Map Reduction	X
Water Chemistry Summary	X	Bathymetric Map	--

LOCATION

Location:	approximately 42 km south-southwest of Mackenzie		
Elevation:	930 m ± 15 m	U.T.M.:	10.481132.6092165
Latitude / Longitude:	54°58'34" 123°17'41"	N.T.S. Map No.:	93 - J / 14
Management Unit:	7-24	Biogeoclimatic Zone:	Sub-Boreal Spruce
Ecoprovince:	Sub-Boreal Interior	Ecoregion:	Fraser Basin
Ecosection:	Nechako Lowlands		

Drainage: Des C. --> Unnamed L. --> Des C. --> McLeod R. --> McLeod L. --> Pack R. --> Williston Reservoir (Parsnip Reach) --> Peace R.

PHYSICAL DATA

Lake Drainage Area:	1.3 km^2	Volume:	81 813 m^3
Water Surface Area:	39 092 m^2	Perimeter of Islands:	0 m
Area Above 6 m Contour:	38 792 m^2	Number of Islands:	0
Shoreline Perimeter:	922 m	Mean Depth:	2.1 m
Maximum Depth:	6.9 m	Secchi Reading:	3.4 m
Filterable Residue (TDS):	40 mg/L		

Sounding Device: Lowrance X- 15 Elevation Source: Contour Interpolation

BENCHMARK

(Iron spike, center of red circle) located 2.0 m above present water level in a 19 cm diameter lodgepole pine tree that is 11.6 m from the present water's edge and located on the northeast shore of the lake approximately 70 m southeast of the outlet (Plate # 4).

High Water Mark: 0.10 m above water level at time of survey

~42km to Mackenzie
93-I/14
McDougall
River
FOREST
NECHAK

LAKE: Swamp Grass Lake

TERRAIN FEATURES

Immediate Shoreline:

Swamp Grass Lake is surrounded on all side by a very wet marsh of common red sphagnum moss and sedge grasses, with alders, willows and an occasional lodgepole pine tree growing throughout. From the edge of the marsh, there is a 1.0 m vertical drop off to the lake's bottom, which then slopes slowly towards the center of the lake.

The shoreline substrate is composed exclusively of silts and organics, with occasional pieces of large woody debris located around the edge of Swamp Grass Lake. There are three beaver huts located on the lake - one on the southwest shore, one on the north shore and one on the east shore. As well, there is a beaver dam located at the north end of Swamp Grass Lake over which the lake is drained.

Surrounding Country:

Swamp Grass Lake is surrounded by a mature forest of mixed tree species. To the west, the forest is composed mainly of lodgepole pine and spruce tree growing on low, gently rolling hills. To the east, the forest is mainly spruce and fir trees growing on low, gently rolling hills. To the north and south of Swamp Grass Lake, the forest is a mixture of spruce, lodgepole pine and fir trees growing on relatively flat ground. There is a patch of deciduous trees located northeast of the lake. Swamp Grass Lake is situated within the Sub-Boreal Spruce biogeoclimatic zone.

LAKE: Swamp Grass Lake

ACCESS

Directions:

From it's junction with Highway 39, drive south on Highway 97 for approximately 1.5 km and turn right on to the Finlay Forest Service Road. Travel north for approximately 12 km, then turn left on to the Tudyah Main Line and proceed for approximately 2 km. Turn right on to the Sabai Main Line and drive for approximately 3 km, then turn left. Proceed along the Holder Main Line for approximately 13.25 km. Turn left on to a side road and drive approximately 2 km to a clear cut. The total distance from the junction of Highway 97 and Highway 39 to the clear cut is approximately 33.75 km From the clear cut, Swamp Grass Lake is approximately an 11 km helicopter ride to the west-southwest.

Road Type and Conditions:

Highway 97 is a well-maintained, two-lane paved highway. The Finlay Forest Service Road and all three Main Lines are well-maintained, two-lane gravel logging roads that can easily be traveled with a two-wheel drive vehicle. The Side road that leads to the clear cut is a maintained, one-lane gravel logging road that can be easily traveled with a two-wheel drive truck.

Restrictions:

Although there are no restrictions, it is recommended that a truck radio be used when traveling on the gravels roads.

RESORTS AND CAMPSITES

There are no resorts or campsites on Swamp Grass Lake.

OTHER DEVELOPMENTS

None noted.

OBSTRUCTIONS AND POLLUTIONS

None noted.

LAKE: Swamp Grass Lake

SPECIAL RESTRICTIONS

None known.

AQUATIC PLANTS

The following aquatic plants were identified during the time of the survey:

yellow waterlily (Nuphar sp.)
sedge grasses
milfoil (Myriophyllum sp.)
eel grass

aquatic moss

WILDLIFE OBSERVATIONS

The following wildlife or signs were seen during the time of the survey:

3 gray jays
moose tracks and beds
unidentified frog
unidentified woodpecker
rabbit droppings

MISCELLANEOUS COMMENTS

1) The part of the marsh located on the southwest side of Swamp Grass Lake is the best landing site for a helicopter.

2) The best location for a Forest Recreation Site is located on the point of land on the northeast shore near the benchmark.

3) Bathymetric map: The lake outline was drawn from an enlargement of air photo 30 BCB94019: No. 018, flown June 22, 1994.

LAKE: Swamp Grass Lake

LAKE DRAINAGE

General:

Swamp Grass Lake is fed by one main inlet and one intermittent inlet. Des Creek drains the lake from the north end and flows for approximately 14 km, including through two Unnamed Lakes, before it joins the McLeod River.

Major Systems:

There are no major systems.

Minor Systems:

Inlet # 1 - Unnamed Creek

Inlet # 1 enters Swamp Grass Lake in the middle of the south shore (Plate # 5). Over the first 40 m upstream of the lake, the creek has an average wetted width of 3.0 m and depth of 1.5 m. The banks are sedge grasses and common red sphagnum moss. The substrate is composed of silts and organics. Approximately 40 m upstream of Swamp Grass Lake, there is a small beaver dam that had been breached so that there is only a 5 cm drop in height. Upstream of the dam, the wetted width of the creek increases to 5.0 m and the maximum depth is 1.7 m (Plate # 6). From this point upstream, some large woody debris has fallen into the creek, and the are alders, willows and some spruce trees growing on the banks. Approximately 100 m upstream of the lake, the creek narrows down to an average wetted width of 3.0 m and a maximum depth of 0.8 m. At this point, some gravels and small cobble show through the silts and organics substrate. Approximately 110 m upstream of Swamp Grass Lake, there is a small beaver dam that is 0.1 m and poses no problem to fish passage. Approximately 125 m upstream of the lake, there is a 1.2 m high beaver dam that has some flow over the top of the dam, but probably not enough to allow for upstream fish passage (Plate # 7). The dam is overgrown with grasses and willows. Upstream of this dam, there is a large pond that is approximately 50 m by 50 m. The creek then narrows to a defined channel that runs through a large swamp. Inlet # 1 had no fisheries potential during the survey period.

Outlet - Des Creek

Des Creek drains Swamp Grass Lake to the north over a 1.2 m high beaver dam located at the lake's edge (Plates # 8 & # 9). There was some flow over the top of the dam, but probably not enough to allow for upstream fish passage at the time of survey. Over the first 40 m downstream of the lake, the creek is braided. Each braid has an average wetted width of 1.0 m to 1.5 m, and an average depth of 0.3 m to 0.5 m. The substrate in each of the braids is composed of silts and organics. The creek is held by banks of sedge grass

and common red sphagnum with willows, alders and a few spruce trees growing on them as well. Approximately 40 m downstream of Swamp Grass Lake, there is a 0.4 m high beaver dam that was probably not passable to upstream fish passage at the time of the survey due to lack of flow over the top. Below the dam, the creek is confined to one channel that has an average wetted width of 3.0 m and depth of 0.35 m. Approximately 50 m downstream of the lake, there is a third beaver dam that is 0.7 m high. This dam stretches downstream for approximately 2.3 m, and was probably not passable to upstream fish movement at the time of the survey due to lack of sufficient flow over the top of the dam. Downstream of the third beaver dam, the creek has an average wetted width of 5.0 m and depth of 0.3 m. The substrate is composed of silts and organics. Approximately 75 m downstream of Swamp Grass Lake, the creek braids again as it flows through a large marsh. The outlet (Des Creek) had no fisheries potential over the length surveyed during the survey period.

LAKE: Swamp Grass Lake

FISHERIES MANAGEMENT COMMENTS

Swamp Grass Lake appears to be barren of all fish species. No fish were caught in four Gee minnow traps or one experimental monofilament gill net set over night. This is likely due to the fact that there was no spawning habitat found in the inlet or outlet creeks. There did appear to be suitable salmonid food in the lake, such as water beetles. The lake is 6.9 m deep, and the fall oxygen / temperature profile does indicate that there is sufficient levels of dissolved oxygen in the water column to support a fish population. It is not recommended that Swamp Grass Lake be stocked as it would require continuous re-stocking to maintain a salmonid population in the lake. As well, there is no easy way to make the lake accessible to the public as there are no logging roads close to it.

HISTORY OF PREVIOUS SURVEYS

Lake Surveys:

None known.

Other Related Studies:

None known.

LAKE: Swamp Grass Lake

WATER CHEMISTRY SUMMARY Limnology Station No. 1

Field Conditions:

Date:	October 10, 1996		
Time:	1136 hrs	Air Temperature:	11.0 °C
Wind Velocity:	0 km/h	Wind Direction:	N/A
Cloud Cover:	10 / 10 o.c.	Surface Conditions:	calm
Secchi Disc:	3.4 m	Water Colour:	clear with a tannic colour

Method Used:

Dissolved Oxygen:	YSI Model 57 Oxygen / Temperature Meter
Water Temperature:	YSI Model 57 Oxygen / Temperature Meter
Air Temperature:	Hand-Held Alcohol Thermometer
pH (field):	Digital pH Pocket Tester
H2S (field):	Hach H2S Field Test Kit
Laboratory Used:	Pacific Environmental Science Center
Water Sampler:	Vertical Alpha Water Bottle (Vandorn)
Metal Sampler:	By Hand; Preserved With 2.0 mL Nitric Acid
Substrate Sampler:	Substrate Sample Not Taken

Water Sample Chemistry: **SEAM Site No.:** E 223170

	Sampling Depths	
	Surface (0.5 m)	Lower (6.0 m)
Alkalinity (lab)	17.2 mg / L	42.3 mg / L
Filterable Residue 105°C (lab)	40 mg / L	91 mg / L
H2S (field)	N/A	0.0 mg / L
Nitrogen - Total (lab)	0.48 mg / L	2 mg / L
Non-Filterable Residue (lab)	< 5 mg / L	14 mg / L
pH (field)	6.8	6.8
pH (lab)	6.99	6.55
Phosphorus - Total Dissolved (lab)	< 0.002 mg / L	0.005 mg / L
Specific Conductance (lab)	40 µS / cm	90 µS / cm

Bottom Depth: 6.9 m

Substrate Sample Depth: N/A

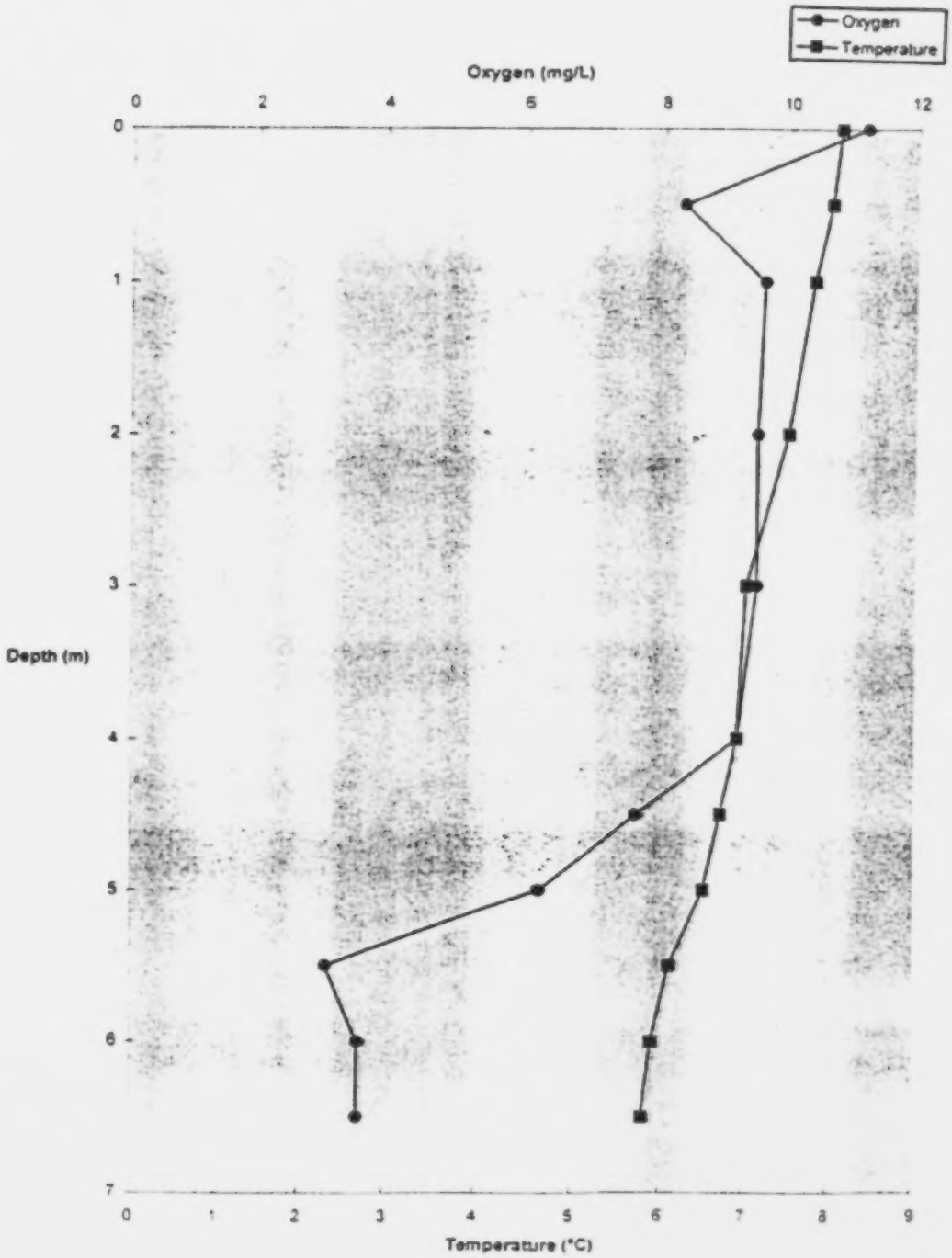
* additional analyzed parameters and results, including metals, are found in Appendix 1

LAKE: Swamp Grass Lake

FALL OXYGEN / TEMPERATURE DATA

DEPTH (m)	02 (mg/L)	TEMPERATURE (°C)
Surface	11.2	8.1
0.5	8.3	8.0
1.0	9.6	7.8
2.0	9.5	7.5
3.	9.5	7.0
4.0	9.2	6.9
4.5	7.6	6.7
5.0	6.2	6.5
5.5	3.1	6.1
6.0	3.6	5.9
6.5	3.6	5.8
6.9	Bottom	

FALL OXYGEN / TEMPERATURE PROFILE



LAKE: Swamp Grass Lake

NETTING RECORD

Mesh Size Experimental Order: 25, 76, 51, 89, 38, 64 mm

NETTING SITE # 1

Type:	Sinking Monofilament Gill Net			
Date Set:	October 9, 1996		Time:	1845 hrs
Date Lifted:	October 10, 1996		Time:	0825 hrs
Net Dimensions:	Length:	91.4 m	Depth:	2.4 m
Shallow End Mesh Size:	25 mm		Depth:	1.4 m
			Substrate:	silt / organics
Deep End Mesh Size:	64 mm		Depth:	4.0 m
			Substrate:	silt / organics

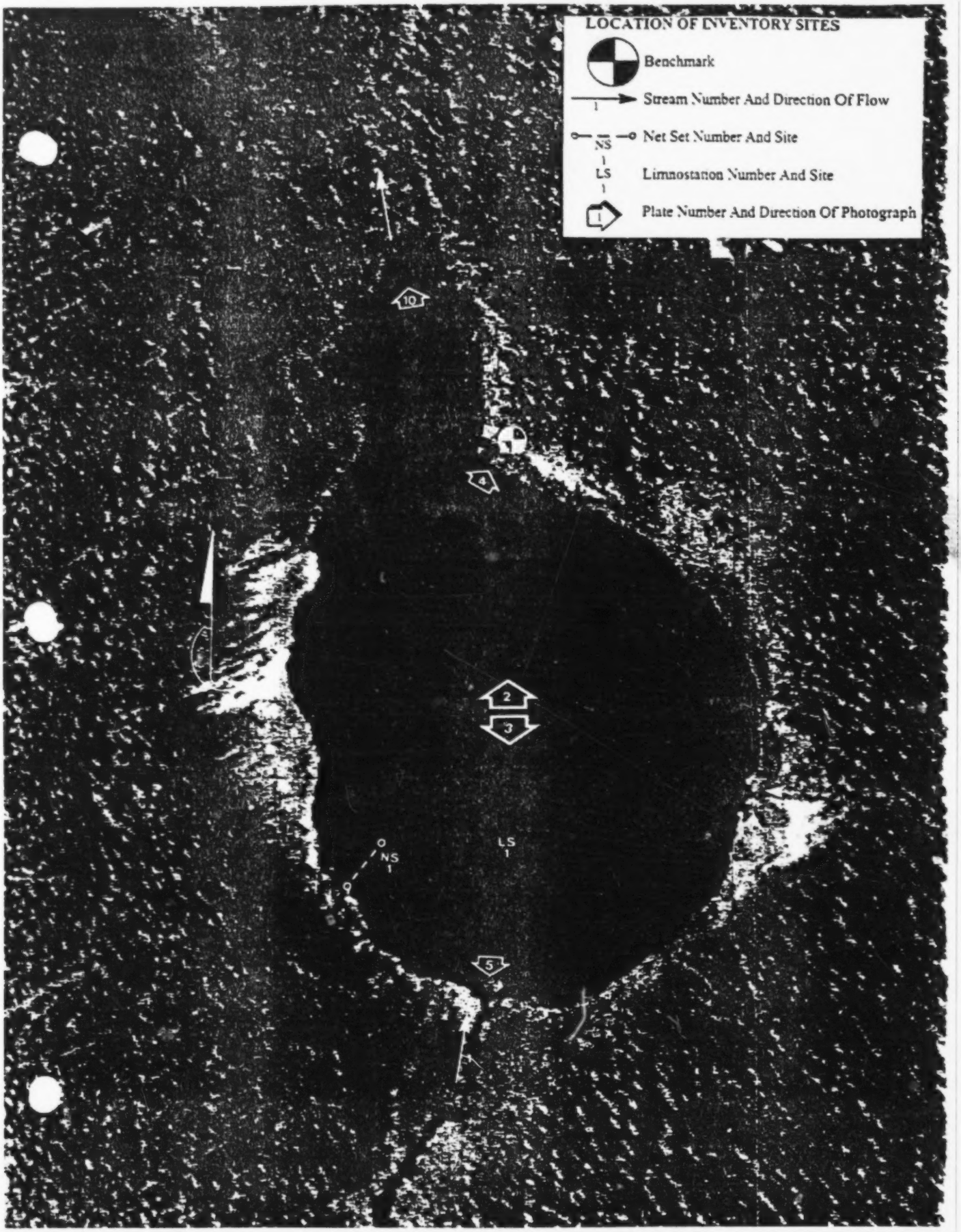
Comments: The net started approximately 2.0 m from the shore. The net was empty.

LAKE CATCH SUMMARY

Minnow Traps:

Bait: Sardines

Trap No.	Hours	Depth (m)	Substrate	Species	No. Caught	Size Range (cm)
1	13:42	1.9	silt / organics	beetle	3	-
2	13:43	1.2	silt / organics	beetle	5	-
3	13:44	1.0	silt / organics	empty	0	-
4	13:43	1.1	silt / organics	beetle	7	-


LOCATION OF INVENTORY SITES
Benchmark
1
Stream Number And Direction Of Flow
NS
1
Net Set Number And Site
LS
1
Limnostation Number And Site
1
Plate Number And Direction Of Photograph
10
4
2
3
NS
1
LS
1
5

LAKE: Swamp Grass Lake

PHOTOGRAPH DIRECTORY

Plate	Roll : Number	Description
1	36: 7	Aerial view of Swamp Grass Lake looking north-northeast.
2	36: 13 - 15	Panoramic view of Swamp Grass Lake looking north from the center of the lake.
3	36:10 - 12	Panoramic view of Swamp Grass Lake looking south from the center of the lake.
4	36: 19	View of the benchmark located 2.0 m above present water level in a 19 cm diameter Lodgepole pine tree that is 11.6 m from the present water's edge and located on the northeast shore of the lake approximately 70 m southeast of the outlet.
5	36: 16	View of the mouth of Inlet # 1 where it enters Swamp Grass Lake on the south shore.
6	*35: 2*	Upstream view of Inlet # 1 showing a typical stretch of the creek, taken approximately 70 m upstream of Swamp Grass Lake.
7	36: 24	Upstream view of beaver dam # 2 on Inlet # 1, located approximately 125 m upstream of Swamp Grass Lake. Dam height is 1.2 m.
8	36: 18	View of the mouth of the outlet (Des Creek) where it drains Swamp Grass Lake from the north end of the lake.
9	36: 22	Upstream view of beaver dam # 1 on the outlet (Des Creek), located at the edge of Swamp Grass Lake. Dam height is 1.2 m.

LAKE: Swamp Grass Lake

Plate # 1: Aerial view of Swamp Grass Lake looking north-northeast.

LAKE: Swamp Grass Lake

Plate # 2: Panoramic view of Swamp Grass Lake looking north from the center of the lake.

LAKE: Swamp Grass Lake

Plate # 3: Panoramic view of Swamp Grass Lake looking south from the center of the lake.

LAKE: Swamp Grass Lake

Plate # 4: View of the benchmark located 2.0 m above present water level in a 19 cm diameter Lodgepole pine tree that is 11.6 m from the present water's edge and located on the northeast shore of the lake approximately 70 ni southeast of the Outlet Creek.

Plate # 5: View of the mouth of Inlet # 1 where it enters Swamp Grass Lake on the south shore.

LAKE: Swamp Grass Lake

Plate # 6: Upstream view of Inlet # I showing a typical stretch of the creek, taken approximately 70 m upstream of Swamp Grass Lake.

Plate # 7: Upstream view of beaver dam # 2 on Inlet # 1, located approximately 125 m upstream of Swamp Grass Lake. Dam height is 1.2 m.

Plate # 8: View of the mouth of the outlet (Des Creek) where it drains Swamp Grass Lake from the north end of the lake.

Plate # 9: Upstream view of beaver dam # 12 on the outlet (Des Creek), located at the edge of Swamp Grass Lake. Dam height is 1.2 m.

Appendix A

LABORATORY REPORT

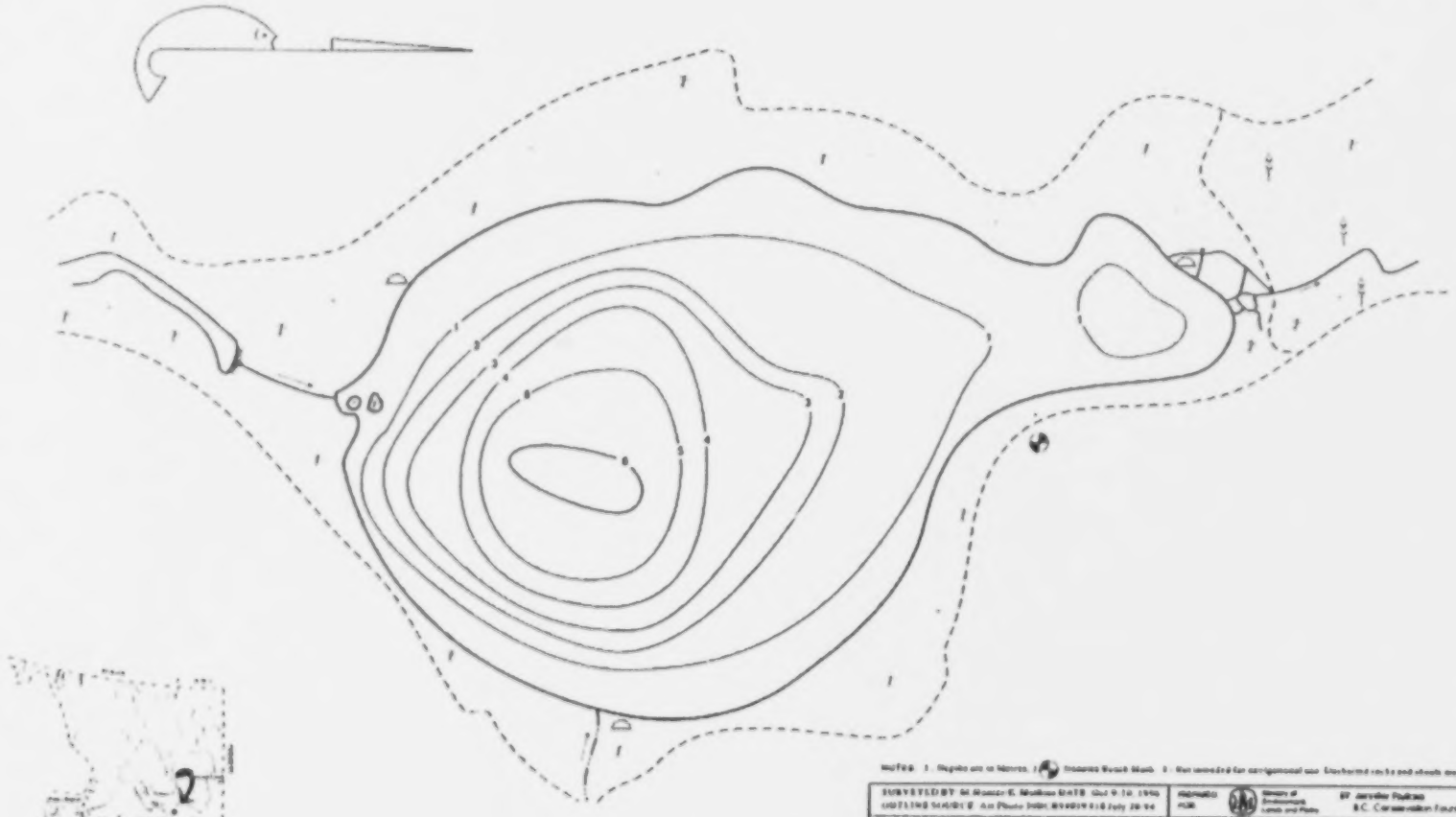
Water Chemistry Analysis

RESULTS FOR SWAMP GRASS LAKE SAMPLES

Parameter Analyzed		Units	965641-001	965641-002
ALKALINITY		mg/l	17.2	42.3
CONDUCTIVITY		uS/cm	40	91
METALS/TOTAL (WATER-ICP)	AG	mg/l	<.01	-
	AL	mg/l	<.06	-
	AS	mg/l	<.06	-
	B	mg/l	<.01	-
	BA	mg/l	.02	-
	BE	mg/l	<.001	-
	CA	mg/l	5.4	-
	CD	mg/l	<.006	-
	CO	mg/l	<.006	-
	CR	mg/l	.006	-
	CU	mg/l	<.006	-
	FE	mg/l	.458	-
	K	mg/l	.3	-
	MG	mg/l	1.2	-
	MN	mg/l	.027	-
	MO	mg/l	<.01	-
	NA	mg/l	.9	-
	NI	mg/l	<.02	-
	P	mg/l	<.1	-
	PB	mg/l	<.06	-
	SB	mg/l	<.06	-
	SE	mg/l	<.06	-
	SI	mg/l	.66	-
	SN	mg/l	<.06	-
	SR	mg/l	.029	-
	TI	mg/l	<.002	-
	V	mg/l	<.01	-
	ZN	mg/l	.005	-
NITROGEN/AMMONIA		mg/l	.047	1.22
/NITRITE+NITRATE		mg/l	<.002	<.002
/TOTAL		mg/l	.48	2
PH		Rel.U.	6.99	6.55
PHOSPHORUS/O-PO4		mg/l	<.001	<.001
/TOTAL		mg/l	.009	.036
/TOTAL DISSOLVED		mg/l	<.002	.005
RESIDUE/FILTERABLE		mg/l	40	90
/NON-FILTERABLE		mg/l	<5	14
BC CLIENT STUDY CODE			20	20
SAMPLING AGENCY		EMScode	91	91
SITE IDENTIFIER/NUMBER			E223170	E223170
COLLECTION START DATE		y/m/d	96/10/10	96/10/10
UPPER DEPTH		metres	0.5	6.0
TEMPERATURE ON ARRIVAL		deg.C	8	8

Appendix B

BATHYMETRIC MAP



Reduced to
34%
of Original Size

STATISTICS AT TIME OF SURVEY

Elevation	950	m ?
Surface Area	68384	sq.m
Area above det. contour	48885	sq.m
Volume	63811	cu.m
Mean Depth	2.1	m
Maximum Depth	6.9	m
Perimeter, Mean Water	933	m
Perimeter, Islands	31	m
Bench Mark	2.0	m

BY Jennifer Perkins
B.C. Conservation Foundation

Swamp Grass Lake